



# GridLiance West LLC And Valley Electric Association

# Transmission Line Circuit Availability Performance Report

2025

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## A. INTRODUCTION

The 2025 GridLiance West LLC (GLW) and Valley Electric Association (VEA) Transmission Line Circuit Availability Performance Report is developed to provide California Independent System Operator Corporation (CAISO) system availability performance measurements between January 1, 2024 and December 31, 2024. This report is submitted to comply with the maintenance reporting requirements outlined in the Transmission Control Agreement (TCA), California Public Utilities Code 348 and the CAISO Tariff.

VEA became a Participating Transmission Owner (PTO) in the CAISO on January 2<sup>nd</sup>, 2013. VEA owns and operates 138 kV voltage class transmission line. In 2017, VEA sold its 230 kV voltage class transmission lines to GLW, and GLW became a PTO in the CAISO. These transmission lines are under the CAISO operational control (Note: VEA's 138 kV transmission lines are classified under 115 kV voltage class per the TCA Appendix C defined voltage classes). Neither GLW nor VEA have complete historical transmission outage data prior to GLW or VEA becoming a PTO at CAISO. Collection of outage data for the purposes of Control Charts started from January 1, 2013.

## **B. APPROACH TO AVAILABILITY PERFORMANCE ANALYSIS**

This report considers the performance of VEA's transmission circuits that are under the operational control of CAISO. VEA's forced outage data from its outage database was submitted to CAISO. These forced outage data was compared with VEA's forced outage information at CAISO (from CAISO's WebOMS system). The data validation was done in accordance with CAISO's Transmission Maintenance Procedure No 5. Transmission outages classified as "Not a Forced Outage" in the procedure are excluded. Moreover, VEA's forced outages that were de-energized for fire and other public safety reasons were also excluded. Transmission outages that last more than three days are capped at 72 hours so that excessively long forced outages do not skew the data. Forced outages in the database were rounded up to the nearest full minute.

The Availability performance of VEA is monitored using control charts. Annual performance indices reflecting annual Availability performance are then plotted on these control charts. The indices below are calculated using basic statistical methodology as outlined in section 4 of the TCA, Appendix C.

- Index 1: Annual Average Forced Outage (IMS) Frequency for All Transmission Line Circuits.
- Index 2: Annual Average Accumulated Forced Outage (IMS) Duration for those Transmission Line Circuits with Forced Outages (IMS).
- Index 3: Annual Proportion of Transmission Line Circuits with No Forced Outages (IMS).

Section 2.3.6 of CAISO Transmission Maintenance Procedure 2, dated 4/13/18, provides guidance on the outage data that should be included in calculating the control chart limits. In addition, the TMCC approved a change in 2014 to the valid Summary outage data used to

initially establish the control chart limits. As a result, the 2025 control charts were generated using forced outage data from 2013 to 2024, (12 years) regardless of any points triggered a test. This established the initial control chart limits. In addition, valid summary outage data from 2013 to present were included in the outage data for calculating the control chart limits provided the point didn't trigger a test. The control charts show 12 years of data, 2013 to 2024.

The statistical chart limits, which are upper and lower control limits (UCL and LCL, respectively) and upper and lower warning limits (UWL and LWL, respectively), are calculated either using so-called "bootstrap" resampling procedures (Indices 1 and 2) or using exact determinations of limits for the proportion chart (Index 3). The Center Control Line (CL) represents the average annual historical performance for a period prior to the current calendar year. The UCL and LCL define a range of expected performance extending above and below the CL. Collectively, the CL, UCL, LCL, UWL and LWL provide reference values for use in evaluating performance. *Note: Metrics provided to CASIO for chart generation and limit development. Review performed by VEA Engineering. In most cases CASIO data utilized over utility generated metrics unless otherwise noted.* 

The four tests have been selected to enable identification of exceptional performance in an individual calendar year, shifts in longer-term performance, and trends in longer-term performance.

**Test 1 Control Limit Test**: The index value for the current calendar year falls outside the UCL (Upper Control Limit) or LCL (Lower Control Limit).

**Test 2 Center Line Test**: At least v1 consecutive annual index values fall above the CL (Center Line) or v2 consecutive annual index values fall below the CL. The actual values of v1 and v2 will be outputted from the bootstrap resampling procedures. The choices for v1 and v2 are designed to keep the probability of these events less than one percent. (Refer to Table 1 of Appendix C of the TCA for values of v1 and v2).

**Test 3 Warning Limit Test:** At least two out of three consecutive annual index values fall outside the UWL or LWL on the same side of the CL.

Test 4 Trend Test: Six or more values are consecutively increasing or consecutively decreasing.

Therefore, Test 1 is designed to detect a short-term change or jump in the average level. Tests 2 and 4 are looking for long-term changes. Test 2 will detect a shift up in averages or a shift to a lower level. Test 4 is designed to detect either a trend of continuous increase in the average values or continuous decrease. Test 3 is designed to assess changes in performance during an intermediate period of three calendar years. If Test 3 is satisfied, the evidence is of a decline (or increase) in Availability over a three-calendar year period.

The four tests will assist the CAISO and VEA in assessing the Availability performance of the transmission system for each voltage class.

## C. PERFORMANCE INDICIATIONS

Performance Indications provided by control charts were tested. Four tests have been selected to enable identification of exceptional performance in an individual year, shifts in long term performance, and trends in longer-term performance. The four (4) tests were applied to the three (3) indices for each voltage class and the results are as follows:

Control Chart		Test	Performance Status Indicated by Test Results			
Туре	Number	Results	Improvement	Degradation	Comment	
	1	value is above the UCL			Test Not Triggered	
		value is below the LCL when LCL>0			rest not mggered	
	2	v1 or more consecutive values above the CL			Test Not Triggered	
115 kV Annaul		v2 or more consecutive values below the CL			Test Not mygered	
Frequency	3	2 out of 3 values above the UWL			Test Not Triggerer	
i ioquono y		2 out of 3 values below the LWL			rest not mggered	
	4	6 consecutive values increasing			Test Not Triggered	
	4	6 consecutive values decreasing			Test Not Higgered	

Control Chart		Test	Performance Status Indicated by Test Results			
Туре	Number	iber Results Improvement Degradation		Comment		
115 kV Annaul	1	value is above the UCL			Test Not Triggered	
		value is below the LCL when LCL>0			Test Not miggered	
	2	v1 or more consecutive values above the CL			Test Not Triggered	
		v2 or more consecutive values below the CL			rest not mggered	
Duration	3	2 out of 3 values above the UWL			Test Not Triggered	
		2 out of 3 values below the LWL			rest not mggered	
	4	6 consecutive values increasing			Test Not Triggered	
		6 consecutive values decreasing			rest not myyered	

Control Chart		Test	Performance Status Indicated by Test Results			
Туре	Number	Results	Improvement	Degradation	Comment	
	1	value is above the UCL	above the UCL		Test Not Triggered	
115 kV Annaul Proportion of Transmission Line Circuits With NO Forced Outages		value is below the LCL when LCL>0			Test Not Higgered	
	2	v1 or more consecutive values above the CL			Test Not Triggered	
		v2 or more consecutive values below the CL			rest not mggered	
	3	2 out of 3 values above the UWL			Test Not Triggered	
		2 out of 3 values below the LWL			rest not mggered	
	1	6 consecutive values increasing			Test Not Triggered	
	-	6 consecutive values decreasing			rear nor mygered	

Control Chart		Test	Performance Status Indicated by Test Results			
Туре	Number	Results	Improvement	Degradation	Comment	
	1	value is above the UCL			Test Not Triggered	
230 kV Annaul Forced Outage Frequency		value is below the LCL when LCL>0			Test Not miggered	
	2	v1 or more consecutive values above the CL			Tost Not Triggoro	
		v2 or more consecutive values below the CL			rest not mygered	
	3	2 out of 3 values above the UWL			Test Not Triggered	
		2 out of 3 values below the LWL			rest not mygered	
	Λ	6 consecutive values increasing			Test Not Triggered	
	4	6 consecutive values decreasing			rest not mygered	

Control Chart		Test	Performance Status Indicated by Test Results			
Туре	Number	Results	Improvement	Degradation	Comment	
	1	value is above the UCL			Test Not Triggered	
		value is below the LCL when LCL>0			Test Not miggered	
000 10/ 0	2	v1 or more consecutive values above the CL			Test Not Triggered	
230 KV Annaul	<u> </u>	v2 or more consecutive values below the CL				
Duration	3	2 out of 3 values above the UWL			Test Not Triggered	
Bulaton	5	2 out of 3 values below the LWL				
	4	6 consecutive values increasing			Test Not Triggered	
	4	6 consecutive values decreasing		1	Test Not mygered	

Control Chart		Test	Performance Status Indicated by Test Resul				
Туре	Number	Results	Improvement	Degradation	Comment		
	1	value is above the UCL			Test Not Triggered		
230 kV Annaul	-	value is below the LCL when LCL>0			Test Not miggered		
Proportion of Transmission Line Circuits With NO Forced Outages	2	v1 or more consecutive values above the CL			Test Not Triggered		
		v2 or more consecutive values below the CL			rest not mggered		
		2 out of 3 values above the UWL			Test Not Triggered		
	5	2 out of 3 values below the LWL			rest not mggered		
	1	6 consecutive values increasing			Test Not Triggered		
	+	6 consecutive values decreasing			rear not mygered		

### **D. DISCUSSION OF RESULTS**

## 115 kV System

The 115kV voltage class no tests triggered

#### 230 kV System

The 230kV voltage class no tests triggered.

Control Chart Limits & 2025 Metric							
Voltage		Control Limit		Center	Warnir	ng Limit	2025
Class	Test	Upper	Lower	Limit	Upper	Lower	Metric
	Frequency	0.908	0.000	$0.318^{*}$	0.675	0.083	0.083
115 KV	Duration	9312.9	1.0	741.6*	8317.5	3.0	2023.0
	Proportion	0.993	0.320	0.735*	0.934	0.439	0.917
	Frequency	0.800	0.000	0.258*	0.600	0.000	0.250
230 KV	Duration	469.0	4.0	$127.4^{*}$	442.5	6.5	69.0
	Proportion	0.999	0.117	0.758*	0.987	0.312	0.750

# **Control Chart Performance Metrics**

\* VEA calculated metric

## E. SUMMARY OF OUTAGE DATA

## 115 kV Voltage Class

Transmission Owner	Transmission Line ID	Voltage Class	Year	Annual Outage Frequency	Annual Outage Duration Minutes
VEA	AMARGOSA-SANDY	115	2024	1	2,023
VEA	CHARLESTON-THOUSANDAIRE	115	2024	0	0
VEA	GAMEBIRD-PAHRUMP	115	2024	0	0
VEA	GAMEBIRD-SANDY	115	2024	0	0
VEA	GAMEBIRD-THOUSANDAIRE	115	2024	0	0
VEA	LATHROP-BEATTY	115	2024	0	0
VEA	LATHROP-JACKASS FLATS	115	2024	0	0
VEA	LATHROP-VALLEY SWITCH	115	2024	0	0
VEA	PAHRUMP-VISTA	115	2024	0	0
VEA	VALLEY SWITCH-VALLEY	115	2024	0	0
VEA	VISTA-VALLEY SWITCH	115	2024	0	0
VEA	INNOVATION-MERCURY SWITCH	115	2024	0	0
			Totals	1	2023

## 230 kV Voltage Class

Transmission Owner	Transmission Line ID	Voltage Class	Year	Annual Outage Frequency	Annual Outage Duration Minutes
GLW	DESERT VIEW-NORTHWEST	230	2024	0	0
GLW	DESERT VIEW-INNOVATION	230	2024	0	0
GLW	INNOVATION-PAHRUMP	230	2024	0	0
GLW	PAHRUMP-GAMEBIRD	230	2024	0	0
GLW	GAMEBIRD-TROUT CANYON	230	2024	1	54
GLW	TROUT CANYON-SLOAN CANYON	230	2024	1	84
GLW	SLOAN CANYON-ELDORADO	230	2024	0	0
GLW	SLOAN CANYON-MEAD	230	2024	0	0
GLW	PAHRUMP-MEAD		2024	0	0
			Totals	2	138

## F. CONTROL CHARTS





Valley Electric Association, Engineering 25 March 2025





Valley Electric Association, Engineering 25 March 2025

